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Original Article

Prognostic factors associated with bilateral, microsurgical vasovasostomy success

Mohammad Ali Ghaed [a,*], Farzam Mahmoodi [b], Hamid Reza Alizadeh [c]

[a] Department of Urology, Rasoul-e-Akram Hospital, Iran University of Medical Sciences, Tehran, Iran
[b] Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran
[c] Department of Surgery, Rasoul-e-Akram Hospital, Iran University of Medical Sciences, Tehran, Iran

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ABSTRACT

Background: A vasectomy (closing or removing a portion of the vas deferens) is the most common method of contraception for men. Almost 6% of the men who undergo a vasectomy seek the reversal of the vasectomy. Many factors can influence the success rate of a vasectomy reversal. It is important for the surgeon to be aware of these factors to clarify postsurgical expectations for the patient and his partner.

Materials and Methods: Records of 50 cases of vasovasostomies performed in Rasoul-e-Akram from January 2014 to January 2015 were extracted. We reviewed all items from the checklists in their records and followed up with the patients after surgery. The factors affecting surgical success were analyzed using SPSS software version 16 (SPSS, Chicago, IL, USA).

Results: The mean time between the vasovasostomy was 8.2 ± 4.81 years (Min:1, Max:22 years). The age of the patients was significantly correlated with the success rate of the vasovasostomy (OR = 0.81, P = 0.005). There was a significant relationship between the time since the vasectomy and the success rate of the vasovasostomy (OR = 0.75, P = .001). Through a logistic regression analysis, a significant correlation was found between smoking and success (P < .05). Postoperative complications and inguinal surgery were also factors that were inversely correlated with success.

Conclusions: In this study, the reverse relationship between certain factors such as age, time after the vasectomy, smoking, post discharge complications, and a history of inguinal surgery, and the success rate of microscopic surgical vasovasostomies has been proven. Considering these factors, surgeons can estimate the likelihood of success before the surgery.

1. Introduction

Annually, 175,000–354,000 vasectomies are performed in the United States, and it is estimated that 3% of the male population will have a vasectomy as a permanent method of contraception in Iran [1,2]. Almost 6% of men who undergo a vasectomy seek the reversal of the vasectomy for a variety of reasons [3]. Vasectomy reversal (VR) is accomplished by either vasovasostomy (VV) or vasoepididymostomy [4]. Many factors have the potential to influence the success rate of VR. Identifying these factors to predict VR outcomes has been an active area of research. It is important for the surgeon to be aware of these factors to clarify postsurgical expectations for the patient. Factors such as surgical skill, the obstructive interval, and partner characteristics have been considered to be great prognostic factors for the VR [5,6]. It is claimed that the VR success rate sharply decreases 10 years after the vasectomy [7]. Factors such as age, lifestyle, the complications after surgery, and a history of surgery around the inguinal area have not been researched widely. Overall, the objective of this study is to assess the prognostic factors associated with bilateral microsurgical VV success in patients with failed vasectomy.

2. Materials and methods

In this cohort study, which was conducted between January 2014 and January 2015, 50 patients who underwent a microsurgical VV participated. The data—including the patients' ages, the ages of the patients' wives, the number of children that the patients had, the time since the vasectomy, the patients' smoking habits, the

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* Corresponding author at: Hazrat-e-Rasoul Surgery Ward, Satarkhan St, Zip postal Code: 1445613131, Tehran, Iran.
E-mail address: borhanresearch@gmail.com (M.A. Ghaed).

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histories of other inguinal surgeries, the histories of undescended testes, the histories of diabetes, surgical complications, sperm appearance in a sperm analysis 6 months after the VV, and the complications after the VV—were recorded in a checklist.

A call was made to the patients, and they were asked to come to the hospital for a postoperative visit and a spermogram. A sperm analysis was performed 6 months after the surgery to assess the success rate of the surgery. The success of the surgery was defined by the sperm appearance in the sperm analysis test after 6 months; this definition was first used by Belker et al. [8].

2.1. Statistical analysis

The gathered data were entered in the SPSS software version 16 (SPSS, Chicago, IL, USA). In descriptive analyses, qualitative and quantitative variables are expressed as percentages and mean ± s tandard deviation. In the analytical analyses, an independent sample *t*-test, a Mann-Whitney test, and a logistic regression analysis were performed. $P < 0.05$ was considered to be significant.

2.2. Ethical considerations

The data were approved by the Ethics Committee of Iran University of Medical Sciences and Health Services. The data were retrieved from the Rasoul-e-Akram hospital from the patients' files, and the retrieval was in accordance with the 1964 Helsinki Declaration. An informed consent was taken from the participants, and they were informed that all the data will be confidential and that all the expenses of the study were covered by the Iran University of Medical Sciences.

3. Results

This study was conducted on 50 patients. The mean age of the participants was 42.16 ± 8.6 years old, ranging from 25 to 66 years old. The mean age of the patients' wives was 35.1 ± 5.9 ye ars old, ranging from 23 to 45 years old. The mean time since the vasectomy was 8.2 ± 4.81 years, ranging from 1 to 22 years. The mean number of children was 1.8 ± 1.8. Of the participants, 21 (42%) married once, 27 (54%) married twice, and 2 (4%) married 3 times. Among the patients' wives, 5 (10%) were nulligravidae, and 45 (90%) were multigravidae. Of the participants, 48% were cigarette smokers, and 52% of the patients did not smoke. Among the patients, 1 (2%) had a history of undescended testes, 15 (30%) had a history of diabetes mellitus, 4 (8%) had a history of previous surgery in the inguinal area, and 30 (60%) had no history of any specific illnesses (see Fig. 1). According to the collected postoperative, 6 patients (12%) had dysuria, 6 (12%) had testis pain, and 2 (4%) had vertigo at the time of admittance. Of the patients, 36 (72%) had no recorded complications. Dysuria was the most frequent complication, and it occurred 1 month after the surgery in 12% of patients; 8% of patients experiences testis pain, which was the second most common complication after microsurgical VV. Of the patients, 80% had no complications after surgery.

According to the Mann-Whitney test, there was a significant relationship between the age of the patients and the success of the VV ($P < 0.001$, OR = 0.8). There was also a significant relationship between the years since the vasectomy and the success rate of the VV ($P < 0.001$, OR = 0.75). According to the chi-square test, there was a significant relationship between smoking and the success of the VV ($P < 0.001$, OR = 0.06). There was also a significant relationship between the complications after being discharged from the hospital and the success of the surgery ($P < 0.001$, OR = 0.05) (See Fig. 2).

A significant relationship was seen between inguinal-area surgeries and the failure of the VV ($P = 0.019$). There was not a significant relationship between the success of surgery and complications after surgery during the time of admittance, a history of testis problems, and a history of diabetes mellitus ($P = 0.8$, 0.054, 0.054, respectively). In the multivariate analysis, logistic regression models were used to analyze the following factors: the patients' ages, the years since the vasectomy, the smoking status, the complications after being discharged, and the surgeries around the inguinal area. Age and the years since the vasectomy were considered two confounding factors for the effect of smoking on the success of VV. The results revealed that smoking cigarettes will decrease the odds of a successful VV by 89% ($P = 0.01$, OR = 0.11) (See Fig. 3).

A history of surgery around the inguinal area was considered to be a confounding factor for age and the success of the VV. The result of a logistic regression analysis revealed a significant relationship ($P = 0.005$, OR = 0.81). Age and the years since the vasectomy were considered two confounding factors for the complications after VV and the success of the procedure. The results revealed that the complications decrease the odds of success by 90% ($P = 0.049$, OR = 0.1).

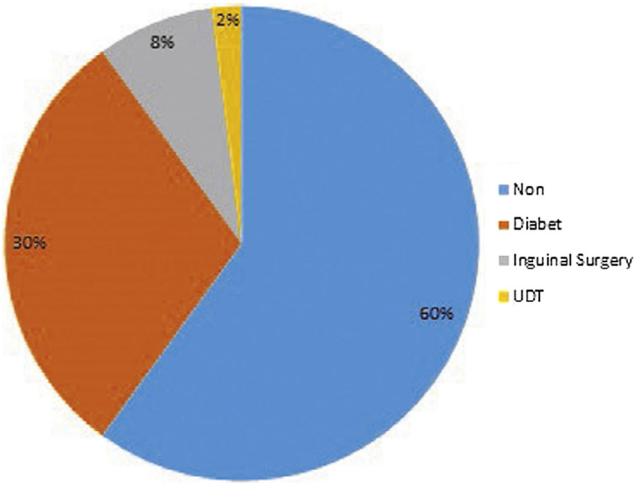

Fig. 1. Patients' comorbidities distribution. UDT: Undescended Testis.

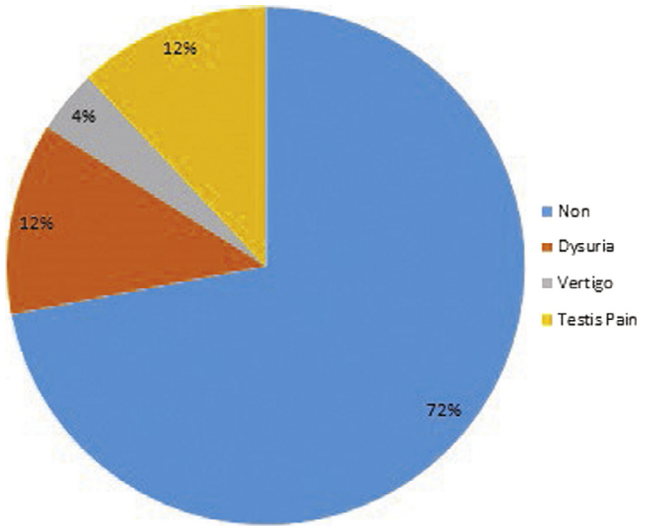

Fig. 2. Postoperative complications in the time of admittance.

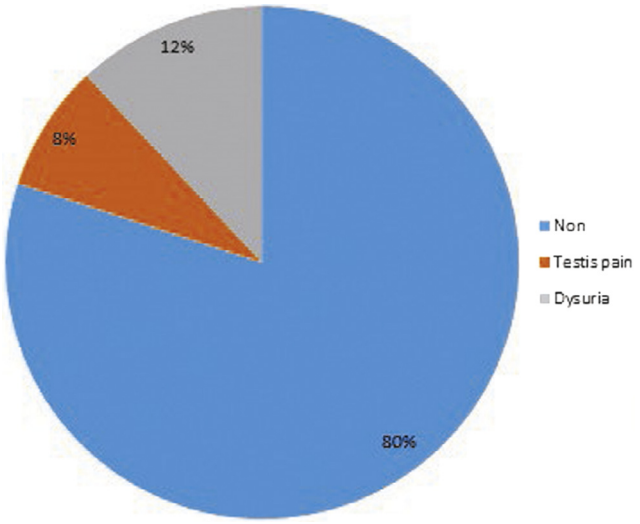

Fig. 3. Postoperative complications one month after surgery.

4. Discussion

A vasectomy is an effective method of contraception, and it has a failure rate of 0.08% [8]. Annually, 500 000 men undergo this procedure, which is considered to be the first contraceptive method for men and the second permanent method of contraception for couples in United States [9]. A VV is a procedure that is used to reverse the effects of a vasectomy. The microsurgical VV method is one of the progressive methods that are used to reverse the effects of a vasectomy. It is important that a good anastomosis is performed during this operation. It should be tension free and watertight [10,11].

VV success is defined by sperm appearance in a sperm analysis 6 months after the VV; this definition was introduced by Belker et al. in 1991 [8]. The success rate of the procedure varies from 46.7% to 95% in different studies [10,12,13]. In this study, the success rate of microsurgical VV was 62%. The association between age and the success of microsurgical VV was investigated in previous studies; the chance of success of VV decreased as age increased [4,14]. The mean age of patients who had a successful surgery was 37.8 ± 8.4 years old, and the mean age of the patients who had an unsuccessful surgery was 47.5 ± 3.9 years old. These results reveal that, as the age increases, the less probable it is that the surgery will be successful. With each added year of age, the odds of a successful surgery decrease by 20%. The relationship between the years since the vasectomy and the success of VV has been investigated in prior studies. Previous studies revealed that, the more time that passes after the vasectomy, the less probable it is that the VV will effectively reverse the effects of a vasectomy [15,16]. Other studies also investigated this matter with a directive approach. In Peng et al.'s study, the authors claimed that there is a significant difference between the procedure's success in men who underwent it less than 15 years after their vasectomies and men who did otherwise [17]. Dohle and Smit also reported a higher patency rate with an interval <5 years compared to that >10 years (89% vs 75%) [5]. Unlike in the previous studies, Boorjian and colleagues demonstrated no change in the patency rates (88–91%), even >15 years after the vasectomy [18]. In this study, a significant relationship was observed between the years since the vasectomy and the success of the VV. The more time that passes after the vasectomy, the less probable it is that the VV will be successful. The mean number of years since the surgery in patients who had a successful surgery was 6 ± 7.3 years, and it was 6 ± 11.4 years in patients who had an unsuccessful surgery. With each year that passes after the procedure, the odds of success decrease by 25%. Diabetes, undescended testes, and smoking habit were investigated in this study. Among these factors, there was a significant relationship between smoking and the success rate of the surgery. A history of surgeries in the inguinal area was shown to have an effect on the success rate of the surgery in the previous studies [19]. It was claimed that the VR success chances decrease after surgeries around the inguinal area. In the current study, the same results were achieved. A limitation of this study is related to the surgery. VV is not prevalent procedures, so there was lack of patients who underwent a VV.

5. Conclusion

Various factors—such as age, the interval between procedures, smoking status, the complications after surgery, and a history of surgery around the inguinal area have an effect on the success rate of microsurgical VV. Considering these factors, surgeons can estimate the likelihood of success before the surgery. It is suggested that more studies with a bigger sample size be conducted to assess the other factors affecting the success rate of the surgery.

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Conflict of interest

The authors disclose no conflicts of interest.

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